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ABSTRACT

In assessing the possibilities of using cable television to serve the needs of higher education, it is useful to examine the experience already accumulated by educational institutions in the use of cable channels. Two particularly interesting cases are those of Oregon State University (OSU) and the University of Oregon. OSU employs its cable channel nearly full-time during the day to televise course presentations (largely of scientific and engineering subjects) to students both on and off campus. Enrollments in these televised courses has grown to 8,500 students annually. The rationale for employing the cable channel is to save money and classroom space. The University of Oregon employs its channel, not to present course materials directly, but to supplement and enrich live course presentations in the classroom by providing programming at the request of individual faculty members. In addition, the channel provides a daily message service, an information service as an integral part of the University's registration procedures, and local community programming. A possible explanation for the University of Oregon's lack of televised course presentations is that the school is largely a liberal arts school and neither the courses nor the faculty are amenable to the idea of new technology. (JY)

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Cable Television and Higher Education: Two Contrasting Experiences

Leland L. Johnson

A Report prepared under a Grant from

THE JOHN AND MARY R. MARKLE FOUNDATION

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PREFACE

Among the many uses to which the multi-channel capability of cable television may be put, potential instructional applications have attracted much attention. Vocational education, adult extension, and programs for obtaining external degrees have been mentioned frequently. In appraising this potential, it is useful to examine the experience that has accumulated to date in the use of cable for such purposes; for in a number of cases cable companies are making channels available to educational institutions.

The purpose of this Report is to explore briefly the contrasting experiences of two institutions -- Oregon State University and the University of Oregon -- each of which has access to a cable channel supplied by the cable system operating in its local area. This exploration illustrates both the opportunities and the problems of employing channels for higher education, and it carries implications for public policy in the future use of cable technology.

This is one of a number of reports completed under Rand's Communications Policy Program. Previous studies in the series include:

Leland L. Johnson, The Future of Cable Television: Some Problems of Federal Regulation, RM-6199-FF, January 1970.

Richard A Posner, Cable Television: The Problem of Local Monopoly, RM-6309-FF, May 1970.

N. E. Feldman, Cable Television: Opportunities and Problems in Local Program Origination, R-570-FF, September 1970.

Rolla Edward Park, Potential Impact of Cable Growth on Television Broadcasting, R-587-FF, October 1970.

Leland L. Johnson, Cable Television and the Question of Protecting Local Broadcasting, R-595-MF, October 1970.

Rolla Edward Park, Cable Television and UHF Broadcasting, R-689-MF, January 1971.

SUMMARY

Much discussion has been directed to the promise offered by cable television in serving educational users. In the past, television has had little impact on formal education. It has tended to be inflexible in use, it has not reduced costs of instruction dramatically, it has suffered the disadvantage of being passive, it has faced a number of institutional impediments, and its programming has frequently not been of satisfactory quality. With respect to cable television, however, there is reason for optimism. This form of television transmission can make available far more channels, greatly enhancing the flexibility of use. Possible two-way service on cable channels would permit student interaction and reduce the passive nature of the medium. If a wider market for instructional programming were to develop, the chances are good that the quality of programming would rise.

In assessing these possibilities it is useful to examine the experience already accumulated by educational institutions in the use of cable channels. Two particularly interesting cases are those of Oregon State University and the University of Oregon, each of which employs a channel provided by the cable system serving the local community.

These two institutions use their channels quite differently. Oregon State University employs its channel nearly full-time during the day to televise course presentations to students both on and off campus. Enrollments in OSU's televised courses have grown impressively over the years and now run to about 8,500 students annually. The rationale for employing the cable channel in this manner is to save money and classroom space. Rough calculations suggest that the extent of cost savings depends on (a) the number of students per class in the absence of television, and (b) the cost of faculty time in coursework preparation and presentation. During the evening the OSU channel is largely vacant. Attractive possibilities for filling the channel with educational programming would arise if the Corporation for Public Broadcasting and the Public Broadcasting Service could work out satisfactory formal arrangements for serving cable systems, as they now serve non-commercial broadcasting stations.

The University of Oregon employs its channel, not to present course materials directly, but to supplement and enrich live course presentations in the classroom by providing programming at the request of individual faculty members. In addition, the channel provides a daily message service, an information service as an integral part of the University's registration procedures, and local community programming.

The University of Oregon is seriously handicapped in filling its cable channel by its dependence on antiquated equipment and by the resulting relatively high maintenance charges. This problem would be alleviated if the Department of Housing, Education and Welfare were permitted by law to fund facilities required for originating programming on cable channels, as the Department is today authorized to do in the case of non-commercial broadcasting stations.

Why is the channel at the University of Oregon not used for course presentations as it is at Oregon State? Although no definitive answer is given here, the difference in channel use may arise ultimately from the fact that Oregon State is an engineering and science institution, while the University of Oregon is a liberal arts school. Two hypotheses offered here are that (a) engineering and science courses lend themselves better to televised instruction than do liberal arts courses, and (b) engineering and science faculty and administrators are more amenable to the idea of new technology being employed on the campus, as it is elsewhere in society.

The differences that mark the two institutions' employment of their channels suggest that pressing problems will eventually arise in major metropolitan areas with respect to allocating channels among alternative educational institutions. Judgments and decisions on the relative needs of particular institutions for channel time, and on how well particular institutions use channels, will not be easy. It is not enough to say that some particular percentage of channels ought to be reserved for educational and other public uses, for critical questions will arise as to how channels should be allocated <u>among</u> such users.

In general, the experience at Oregon State and the University of Oregon suggests that cable television can serve an instructional need in a far more flexible and expanded manner than can over-the-air broadcast. However, the extent to which the potential is exploited elsewhere in the nation as cable continues to develop will depend heavily on the institutional environment, shaped in turn by the attitudes of faculty members and administrators.

ACKNOWLEDGMENTS

The author acknowledges with gratitude the extensive assistance in gathering information for this report, including the Appendix materials, of Professor Harold Livingston, Director of the Kidder Hall TV Center at the Oregon State University, and of Professor John Sheppard, Director of the Division of Broadcast Services and Televised Instruction at the University of Oregon. He is grateful for their patience in answering the questions and for helpful comments on an earlier draft. Comments on an earlier draft by David Chu and Edmund Dews of Rand were also very useful. Of course, the author is solely responsible for any errors that remain in fact or interpretation.

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I. INTRODUCTION

Much discussion has been directed to the promise offered by the multi-channel capability of cable television for improving educational instruction. Channels, it is said, could provide college course material to viewers at home in a more convenient and possibly less costly way than could be done in the classroom. Housewives seeking to complete their degree requirements, part-time workers unable to carry a normal course load, and persons who need remedial work or who have other special requirements might find televised courses of particular benefit. More generally, such a system could provide easier access to higher education to those many groups, including the disadvantaged minorities, that simply cannot afford the luxury or suffer the inconveniences of the conventional four-year stint on campus.

In appraising these possibilities, we must bear in mind that television in general (as distinguished from cable television in particular) has not yet had much impact on formal education, despite the early talk about revolutionizing academic institutions. It is easy to imagine a "master" teacher before the camera, reaching thousands of widely scattered students at far less cost per student than would be possible in a classroom. Indeed, with the development of communications satellites for cheap interconnection, one can visualize a nationwide educational system, perhaps along the lines of England's new Open University. With this promise and hope have come many (though isolated) applications of television to the instructional process. And with them have come countless studies designed to monitor and evaluate this experience. There has been some success -- and much disappointment. Although studies have typically shown that students can learn about as well from television as from classroom instruction, some earlier uses of television have been abandoned.[1] The example of

[1]For example, Delaware recently abandoned the use of its statewide instructional television network. According to news accounts, "The network, five years old, operated in an atmosphere of increasing friction in its final years. Its abandonment has left approximately one million dollars worth of equipment unused and what was once a full-time staff of more than fifty persons unemployed." New York Times, July 5, 1970.

schools that have successfully integrated television into their course curricula, as in Anaheim, California, and Hagerstown, Maryland, has not been widely imitated. Although television is supposed to reduce the cost of instruction, it is frequently the first, along with audio-visual instruction in general, to suffer funding cuts in time of budgetary pressure. Despite the talk and bright promise of the past, instructional television is still widely regarded as a frill.

Reasons for this failure of impact are not hard to discover. For one thing, television has tended to be inflexible in use. A program broadcast at 10:00 a.m. may be fine for teachers whose classes are scheduled for that time; but what about teachers whose classes do not convene until 10:15? Although the program may be rich in informational content, it drones on and on in the face of whatever classroom distractions may occur. As has been noted in one study:

> Control of the class could quickly be lost if aides weren't able to head off pending problems. A major source of disruption was inappropriate pacing in the TV instruction; that is, if there was not time to distribute materials or solve problems before the TV teacher moved on, students became perturbed and noisy... Minor disruptions, such as a person entering the room, can seriously affect the TV viewing -- the TV rolls on, regardless."[1]

For another thing, experience to date does not suggest that television has had any dramatic effect on cost -- at least not to the point of interesting school administrators in widely utilizing the medium. As many have observed, television costs money rather than saves it. Although the additional cost may be worthwhile in terms of enriching overall course content, this is not an impressive argument to administrators facing budgetary crises.

Moreover, television suffers the disadvantage of being passive, unless an alert instructor is on hand to interact with information on the screen. Students may watch but they may not necessarily pay attention. An advantage of live instruction is that the student is

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[1]"Using ITV to Cut Instructional Costs," BM/E (The Magazine of Broadcast Management Engineering), November 1970, p. 30.

encouraged to stay awake by the knowledge that he may be asked a question in class. Live instruction has the additional advantage, of course, of permitting students to raise questions and to interact with the instructor and with other students.

Another problem arises from what might be called "institutional" impediments to change. Faculty members and administrators alike have reason to resist the widespread use of television or, for that matter, the adoption of any innovation that would seriously upset the established way of doing things. What incentive does a faculty member in a comfortable tenured position have to encourage the use of, or to participate in, televised instruction? Rather than achieving special recognition, he may be frowned upon or ostracized by his peers. Accustomed to dealing directly with students and supplementing his presentations with textbooks and other printed material, he is not likely to appreciate the expanded opportunities of using lectures televised by others -- especially by those who are better teachers than himself. Much easier to pursue the publish-or-perish game, he might reason, and teach the 6 to 12 hours per week (behind closed doors) than to push for technological advances that at best he would regard as an annoyance and at worst he would fear as a threat.

So far as department heads are concerned, they may well feel that their time and energy are better spent seeking larger (or at least suffering no smaller) portions of the overall academic budget than pushing for imaginative innovation that would reduce their needs for funds -- and also possibly reduce the relative importance, at least in appearance, of their departments on campus. As for college presidents, their time might be better spent, so they might reason, seeking additional aid from state legislatures or from alumni and other private sources -- all the more so if the case that television saves money cannot be clearly demonstrated and if faculty resistance is strong.

Finally, a serious problem with television is that the instructional programming is frequently not very good. Here we face the familiar chicken-and-egg problem. Because the demand for instructional services has been weak, the market for programming has been severely

limited. A number of private firms have entered, and left, the educational programming field. Although technology on the horizon, such as the development of video-cassettes, may stimulate the market for instructional material, this cannot be counted on today with confidence as a major growth area.

With the severely limited budgets typically available for programming, little leeway exists for imaginative experimentation to improve the instructional effectiveness of television. All too often, the effort consists of placing in a television "classroom" an instructor who proceeds to give a "standup lecture" as a straight substitute for a live presentation. All in all, despite years of experience, it is fair to say that we still know much too little about how to exploit the audio and visual dimensions of the television medium for formal instruction.

In view of these factors we can well ask what difference, if any, cable television is likely to make. Here, there is reason for optimism. In contrast to broadcast television or closed-circuit systems of the past, cable television can make available a large number of channels, greatly enhancing the flexibility of the medium (in scheduling and content) to meet the needs of individual teachers and students. It is technically possible to offer two-way service on cable channels, permitting the student to ask or respond to questions as he watches the program.[1] Thus, the element of passivity would be somewhat reduced. If cable channels were to be used widely in response to this greater flexibility and viewer feedback, the cost of studio equipment and programming software would be spread over larger numbers of students, allowing reductions in overall cost per student of a sort that have been so widely hoped for in the past.

We would still be faced with the institutional constraints outlined above. Indeed, faculty members might view all the more seriously

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[1] Unfortunately, the cost and the usefulness of such feedback are not adequately known at this time, but can be determined only after a substantial amount of well-designed future experimentation.

the threat of cable television precisely because it may turn out to be effective. If such systems perform well, however, their attraction may be sufficient to overcome this resistance. Student costs are rising rapidly; severe budget constraints are encountered on most college campuses. Increasingly, disenchantment is being expressed about the value of the tradition-bound structure of higher education. Attention is being devoted to the desirability of open admissions and the integration of the student's real-life experience with his higher education. Conceivably, these pressures working together could force a searching reappraisal and eventual restructuring of higher education -- a restructuring in which television would play a major role. As two educators have observed:

> A resident college education next fall will cost parents about $4,500 a year at most of the nation's leading private colleges and universities, and close to $3,000 at many public colleges and universities. By 1980, the charges could be $8,000 and $5,000 respectively. To anyone seriously concerned about providing some form of higher education to every American who desires it and can benefit by it, the economic situation is patently serious. It is neither shameful nor contemptible to be searching for new modes of providing high-quality education at a lower cost.[1]

This is not to imply that televised instruction would make the teacher obsolete. Rather, the critical question is the appropriate mix of live instruction, printed materials, televised materials, other audio-visual aids, computer-assisted instruction, and the like. The truly superior teacher, being in a position to command a relatively high salary, would probably be well off with television. There would likely be a strong demand for teaching assistants and junior faculty people to assist in tutorials and seminars as a supplement to the large-attendance, televised courses. It is the faculty member accustomed to presenting sloppily prepared lectures, behind closed doors, who would be vulnerable.

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[1]Ernest K. Boyer and George C. Keller, "The Big Move to Non-Campus Colleges," Saturday Review, July 17, 1971.

Yet this is largely conjecture. To go a step further in exploring the potential of cable, it is well to note that already a number of cable companies have made channels available free of charge to educational institutions. It would be useful to examine the experience that these users have so far accumulated. Two particularly interesting cases are those of Oregon State University in Corvallis and the University of Oregon in Eugene. The balance of this Report describes and appraises briefly the experience of these two campuses in the use of cable, drawing on information gathered during a visit by the author to these campuses in April 1971.

II. THE CASE OF OREGON STATE UNIVERSITY

The Corvallis TV Cable Company, commencing operation in 1964, currently has about 4,000 subscribers. It is a conventional system of twelve channels, drawing its appeal largely from retransmitting the signals of broadcasting stations in Portland and Eugene. In addition, it provides one channel -- Channel 5 -- to Oregon State University and another channel -- Channel 11 -- for local community program origination. The University is making extensive use of Channel 5, about 40 hours per week, to provide televised lecture courses to students both on and off campus. Accessibility to these courses is relatively easy, since, in addition to a half-dozen classrooms wired for television, dormitories and other buildings are linked into the cable system along with several thousand homes, including the off-campus residences of many students. Currently, about 60 percent of the students enrolled in television courses view them outside of classrooms.[1]

COURSES AND ENROLLMENTS

Table 1 lists the courses offered in the spring of 1971. The courses are videotaped, some in prior years, and most are shown at least twice during the day for the convenience of students. For example, the two weekly televised lectures for Psychology 200 are shown on Monday and Wednesday at 8:00 a.m. and repeated at 1:00 p.m. In addition to the televised lectures, each course involves one or two "recitation" meetings on campus each week to permit students to ask questions and to interact more generally with the instructor and the other students in conventional fashion. Course examinations are given on the campus, also in conventional fashion. All courses

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[1]Since the course material is carried on cable to non-student residential subscribers as well, an additional benefit may lie in the fact that home viewers are able to tune in on the courses. Although no analysis has been made of such benefits, it is known through telephone calls and letters that a number of townspeople do watch OSU instructional programming.

Table 1

OREGON STATE UNIVERSITY CLASSROOM TV LESSONS TELECAST OVER CHANNEL 5 OF THE CORVALLIS CABLE COMPANY, SPRING QUARTER, 1971

Hour	Monday	Tuesday	Wednesday	Thursday	Friday
8 a.m.	Psychology 200	Psychology 202	Psychology 200	Psychology 202	--
9	General Science 103	Black History Experimental College	General Science 103	Black History Experimental College	--
10	Black History Experimental College	General Science 103	Black History Experimental College	General Science 103	--
11	Mathematics 163	Economics 115	Mathematics 163	Economics 115	Mathematics 163
12	--	--	--	--	--
1 p.m.	Psychology 200	Economics 115	Psychology 200	Economics 115	--
2	Mathematics 163	General Science 103	Mathematics 163	General Science 103	Mathematics 163
3	Mathematics 162	Economics 115	Mathematics 162	Economics 115	Mathematics 162
4	--	--	--	--	--
7	General Science 103	Psychology 200	General Science 103	Psychology 200	--
8	Mathematics 163	--	Mathematics 163	Mathematics 163	--
9	Black History Experimental College	--	Black History Experimental College	--	--

selected for televising are drawn from those having large enrollments. Generally a course is televised only if the enrollment exceeds 250 students. The average enrollment for the courses listed in Table 1 runs to about 350 students.

In earlier years, each of these courses was offered simultaneously in conventional-classroom and in televised form, giving students a choice between the two. Because students tended to select the televised offerings, these courses are now carried only on television (combined with the weekly on-campus meetings noted above).

Table 2 shows the impressive growth of TV enrollments over the years, now running to about 8,500 students annually. As shown in Table 2, the closed-circuit operations dating from 1964 are those on Channel 5 of the local cable system. In earlier years, course material was broadcast over KOAC, the local educational non-commercial station, in the same manner that many other educational institutions currently rely on non-commercial broadcasting stations for program reception.

Notably, as the use of televised courses grew on the OSU campus, an increasingly large portion of KOAC's broadcast day was taken up by this use -- to the increasing complaint of KOAC's management and general viewers, who felt this to be a too-specialized use of broadcast facilities. Although the audience of a non-commercial educational station has a more specialized taste than the audience of an ordinary commercial station, the station must necessarily view its role in terms of serving a wide variety of needs in the whole community. The advantage of cable lay in permitting KOAC and OSU to go their separate ways in pursuing their own best interests.

MECHANICS AND COSTS OF THE SYSTEM

Videotaping for the courses is done in a studio classroom at the Kidder Hall TV Center, connected by coaxial cable to the cable system headend in Corvallis. Course material is prepared by volunteer professors who are not paid separately or directly for their efforts but whose ordinary course loads are reduced in proportion to their televised

Table 2

OREGON STATE UNIVERSITY ENROLLMENTS IN TELEVISED COURSES, ACADEMIC YEARS 1957-1970

Academic Year	Television Facilities	Student Enrollment
1957-1958	KOAC-TV	554
1958-1959	KOAC-TV	787
1959-1960	KOAC-TV	1,265
1960-1961	KOAC-TV	2,440
1961-1962	KOAC-TV	4,319
1962-1963	KOAC-TV	4,095
1963-1964	KOAC-TV	4,256
1964-1965	Limited closed-circuit plus KOAC-TV	5,186
1965-1966	Limited closed-circuit plus KOAC-TV	6,479
1966-1967	Completed closed-circuit facilities	7,549
1967-1968	Closed-circuit	8,300
1968-1969	Closed-circuit	8,400
1969-1970	Closed-circuit	8,500

course load. Cameras and other equipment for lectures are of relatively high quality, including 2-inch videotape black and white machines (the OSU TV Center is experimenting with the new 1/2-inch tape machines now coming onto the market). The total cost of the equipment ran to about $170,000, including tape machines, a film chain, cameras, lighting, and so on. A more detailed description of production facilities is contained in Appendix A.

The annual operating budget runs to about $70,000 per year, including the salaries of the chief engineer, two technicians, a program director, and a clerk, and maintenance of the equipment. It does not include the salaries of the faculty staff, who are supported within their own departments, or the costs of course examinations or other components of course offerings.

On the other hand, the $70,000 includes many services to the University in addition to filling one cable channel. While TV lessons are being transmitted on Channel 5, the Center averages about 75 hours per week of additional television production and playback services on campus, using as many as five videotape machines each carrying a TV lesson to a different campus location. These lessons are carried from the television center to a number of key locations around the campus on a coaxial cable system separate from the Corvallis system that carries Channel 5. These other services are described briefly in Appendices B and C.

The rationale for the televised course programs at OSU is that they do save money, in terms of classroom space and faculty salaries. In fact, one of the major reasons for initiating the television series was to cope with a severe shortage of classroom space in the mid-1960s for large-enrollment courses.

Cost data are not available in sufficient detail to permit a rigorous analysis of the extent of cost savings. However, rough calculations suggest that the extent of savings for a given total student enrollment depends crucially on (a) the size of classes that would have been required in the absence of television and (b) the amount of time spent by faculty members in academic activities outside of

preparing for and meeting classes. With 8,500 students taking a television course during the year, the average per quarter is 2,800. If in the absence of television they were divided into 56 sections of 50 students apiece, with each section meeting twice a week, some 112 course hours of instruction would be required.[1] In contrast, the 20 different course presentations shown in Table 1 (excluding the afternoon repeats) require only about 20 course hours of instruction -- even less, inasmuch as some courses are handled by videotape repeats from prior quarters and years.

The dollar savings in going from 112 to 20 course hours depends on the cost of faculty time at OSU. At one extreme, we could assume that since a faculty member at OSU teaches generally between 9 and 12 hours per week, the 112 course hours per term would require roughly 10 full-time faculty equivalents for the three-term year. For an average nine-month salary of about $12,000 (plus about 20 percent for fringe benefits, overhead, and other support) the total cost of these faculty equivalents would run to about $144,000 in the absence of television.

However, we must remember that television, as used at OSU, substitutes only for classroom and course-preparation time. It does not obviate whatever need exists for faculty members to meet with individual students, to serve on committees, and to perform a variety of other academic and non-academic functions. Thus, if a faculty member with a 12-hour course load devotes two-thirds of his time to course preparation and presentation and the other one-third to other necessary academic activities, then a 12-hour reduction in classroom teaching time would result in a saving over the year of two-thirds of the faculty slot. Under this assumption, the 112 course hours over the year would be valued at $96,000, or two-thirds of the $144,000 above.

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[1] In addition to these course hours, students meet with instructors on campus once or twice a week as a supplement to the televised presentations. Only the televised portion of the courses, and the class-time savings resulting from it, are included in these cost comparisons.

From these savings must be subtracted the cost of the televised course preparation and presentation. The 60 course hours of television programming per year would have a faculty cost of about $18,000. Also we must include some portion of the $70,000 annual operating expense of the OSU television center (which includes other activities listed in Appendix C). Let us say that one-half, or $35,000, should properly be allocated here. In addition, if the $170,000 capital cost is amortized over ten years at an interest rate of 6 percent, this would run to roughly $22,000 annually, which, allocated equally between televised instruction and other uses listed in Appendix C, would run to $11,000. Adding together the $11,000 in capital cost, the $35,000 in operating cost, and the $18,000 in faculty salaries, we have a total of $64,000. Subtracting $64,000 from the $96,000 required in the absence of television, we find a saving of about $32,000. (Additional savings, hard to calculate, would accrue also from reduction in classroom building requirements.)

These computations are recapitulated in Table 3. The table also shows that if class size were reduced to only 25, much larger savings of approximately $128,000 per year would accrue. If class size were 100, savings would turn negative.

Three major points emerge from Table 3. First, the cost of faculty time for televised instruction is a relatively small part of the total faculty time required to teach courses in the absence of television. To permit the instructor additional time to prepare improved course materials on television may be a good investment. To do well before the television camera generally requires greater care in preparation than one would normally devote to live presentations. For example, preparation of a three-hour television course might be counted as "double credit," for a total of six hours, against whatever teaching load the instructor would otherwise carry. Were double credit entered into the calculations above, the increase in faculty salaries with television in Table 3 from $18,000 to $36,000 would still afford a net saving with television for class sizes of 50 or fewer.

Table 3

ESTIMATED ANNUAL COST SAVINGS GENERATED BY TELEVISED INSTRUCTION, OREGON STATE UNIVERSITY
(8,500 students total annual enrollment)

		Number of Students Per Class in Absence of Television		
		25	50	100
Faculty Salaries Without Television		$192,000	$96,000	$48,000
Less Faculty Salaries with Television	$18,000			
Television Center - Annual Operating Expenses	35,000			
Amortization of Capital	11,000			
		64,000	64,000	64,000
Net Savings		$128,000	$32,000	$-16,000

Second, these cost figures do not take into account differences in the quality of instruction between televised and non-televised offerings. No rigorous evaluation has been undertaken at OSU to determine whether the use of television affects quality one way or the other. However, on the basis of student performance in televised courses to date, there is no evidence to suggest that significant quality differences exist. In this connection, it is well to note that in a large survey of the many past studies in the instructional use of television, comparisons of televised and conventional instruction showed no significant differences for the great majority of cases.[1]

Third, the savings from use of television depend also on the total enrollment of students. Suppose that instead of 8,500 students there were twice as many, or 17,000. In this case even for the large class size of 100 in Table 3, faculty salaries in the absence of television would run to $96,000 or over 50 percent more than the total cost of $64,000 required to provide the programming. One way of spreading the cost of programming over more students is to share course materials among institutions (in the same way that textbooks today are widely distributed). The key to enhancing the instructional effectiveness of television may lie in spending a relatively large amount of money on the preparation of good programming (such as by giving double credit, as noted above) and then sharing the programming with other institutions.

Unfortunately, the history of televised instruction suggests that many impediments stand in the way of widespread sharing of televised programming. Some are highlighted below in the (Section III) discussion of the Inter-Institutional Project of Televised Instruction. However, OSU has recently made encouraging progress in sharing programming, which we shall now discuss.

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[1] Goodwin C. Chu and Wilbur Schram, Learning from Television (Washington, D.C.: National Association of Educational Broadcasters, 1967), p. 7. In a total of 202 comparisons of television and conventional teaching at the college level, 152 showed no significant difference in student performance, 22 showed television to be more effective, and 28 showed conventional teaching to be more effective.

SHARING PROGRAMMING WITH OTHER INSTITUTIONS

Although Corvallis townspeople subscribing to cable are free to watch OSU's programming on Channel 5, only regularly enrolled students at OSU have been permitted to take the televised courses for credit. As mentioned earlier, one of the potentially attractive applications of cable is to permit widely scattered viewers, unable to participate in regular campus activities, nevertheless to complete at least some degree requirements at home. OSU has not been able to offer this service because of a jurisdictional problem: any extension or adult education courses are handled by the Linn-Benton Community College -- separate from the University system in Oregon's structure of higher education.

Notably, in 1971, an agreement was reached between OSU and the Linn-Benton College to permit joint use of programming on a one-year experimental basis. According to current plans, all OSU television lessons will be integrated into the Linn-Benton curriculum for credit for those Linn-Benton students who wish to sign up and who have access to the Corvallis cable outlets. A viewing room will also be set up at Corvallis High School for these students. The owner of the Corvallis cable system, Liberty Television, Inc., likewise owns the system in nearby Lebanon. In addition, it holds the franchise for nearby Albany, and it has recently started wiring one section of that city. These three communities form the area from which over 80 percent of the Linn-Benton students are drawn. Plans have been projected by Liberty to link these three systems by microwave within the next three years to make possible a link between OSU and Linn-Benton for a variety of instructional purposes.[1]

This is an encouraging development. One of the most serious problems in instructional television is institutional reluctance to share programming. Although it may well be in society's interest that expanded use be made, impediments involving organizations and personalities, copyright problems, and miscellaneous red-tape frequently obtrude. Such factors, tending to narrow and compartmentalize

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[1]Albany and Lebanon are, respectively, about 15 and 25 miles from Corvallis.

the use of televised programming, are partially responsible for the fact that instructional television in the past has shown no substantial reduction in per-student cost. The experience that OSU and Linn-Benton accumulate during their one-year experiment should prove illuminating.

ADDITIONAL LOCAL PROGRAM ORIGINATION

As mentioned earlier, a second channel on Corvallis Cable -- Channel 11 -- is reserved for originations to meet broader community interests. The equipment for this channel is owned by the private cable company, with staffing drawn largely on a volunteer basis from broadcast trainees and other students at OSU. Examples of current programs are shown in Appendix D.

It is notable that this channel is used only during the evenings. One might ask why a variety of other programming already on videotape cannot be made available during the day (as well as for OSU's Channel 5 when it is unused during portions of the evening). For example, why not make available a wide range of children's programming, including Sesame Street, during late afternoon hours? Why not use programming available through the Corporation for Public Broadcasting on a repeat basis during the day and during evening slots that are now vacant? While the audience on any one showing would be small, the additional costs would also be small, since videotapes would be run from programs already being carried by microwave to non-commercial broadcasting stations; subsequently, the tapes could be erased for later reuse.

There are two main reasons why this is not being done -- despite the potential benefit to society. First, it would fragment the audience of the local non-commercial broadcasting station, KOAC. This station already shows programs made available through the Corporation for Public Broadcasting and through other non-commercial sources. If the same programs were repeated on cable during other time slots, the audience of KOAC would be reduced. This is the same kind of problem that commercial broadcasters are currently so worried about.

They oppose the practice of cable systems' bringing in commercial programs from distant stations, because this would reduce their own audiences and advertising revenues. Non-commercial broadcasters are no less upset in cases where cable operators would like to bring in distant non-commercial signals that would threaten to fragment the already small audience interested in educational, non-commercial programming. They would be equally concerned if educational programming were videotaped and shown on a multiple repeat basis on local cable origination channels. So far as the competitive threat of cable is concerned, non-commercial broadcasters exhibit little difference in viewpoint from commercial broadcasters.

Second, arrangements have not yet been worked out to permit cable operators to originate, on their own channels, programming made available by the Corporation for Public Broadcasting and the Public Broadcasting Service. These organizations were originally established to serve non-commercial broadcasting stations. Although CPB and PBS have been considering how they might also independently serve cable systems, no formal arrangements have yet been made. Such arrangements would seem particularly appropriate in view of the hopes recently expressed by PBC to provide through non-commercial broadcast stations a nationwide system of high school equivalency preparation.[1] By offering additional channel time to permit repeats of programming suiting the convenience of individual viewers, cable would have an advantage over conventional broadcast stations, which, as mentioned, cannot easily devote large blocks of time to such highly specialized uses.

In this connection it is well to recall that in past years one high school equivalency series -- the "TV High School" -- was broadcast in more than two dozen cities. In general, the results were discouraging, in part because of the inflexibility of program scheduling characteristic of broadcast television. For example, in both Washington

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[1] New York Times, April 15, 1971.

D.C. and in Los Angeles, TV High School was broadcast during a most inconvenient time of day for learning -- 6:00 to 6:30 p.m.[1]

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[1]H. S. Dordick et al., Telecommunications in Urban Development, The Rand Corporation, RM-6069-RC, July 1969, pp. 36-37. Perhaps as the potential of cable becomes more fully utilized for distributing educational programming, it will be appropriate for the Corporation for Public Broadcasting to be renamed the Corporation for Public Television; and similarly for the Public Broadcasting Service.

III. THE CASE OF THE UNIVERSITY OF OREGON

The cable system in Eugene, owned by TelePrompTer, has 19,000 subscribers. As in Corvallis, the cable company makes available a channel (called PL-3) to the Division of Broadcast Services and Televised Instruction of the University of Oregon, and a channel is reserved for local origination by the company itself.

CHANNEL USES

The experience with PL-3 in Eugene has been substantially different from that with Channel 5 in Corvallis. PL-3 carries no course lectures of the sort listed in Table 1 as a substitute for live instruction. Rather, it carries during the school day materials specifically requested by faculty members to supplement or enrich their own course offerings. For example, an English Literature teacher might request a particular 30-minute program discussing Shakespeare, drawn from the videotape library at the University. On the average, about two hours during the school day are devoted to programs of this sort requested by faculty members. Also during the 1970-1971 school year 46 hours on PL-3 were devoted to direct instructional programming in the 43 elementary schools of the Eugene public schools district. This programming, carried on a three-times-per-week basis, served a total of nearly 11,000 elementary students. The rest of the time during the school day is generally spent televising a message service consisting of a camera in front of an endless moving belt on which are clipped messages about campus and community activities. Appendix E describes in more detail the operation of PL-3.

During the evening the channel is employed for a variety of educational and community programs and for televising numerous athletic events. An example of the evening program log is contained in Appendix F.[1]

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[1]The local cable company is also originating programming similar in some respects to that offered on PL-3 during the evening. With such a large subscriber base, the company can afford rather elaborate camera, and other studio facilities. It has been originating for one and one-half

In general, use of PL-3 has concentrated on "narrowcasting" to small audiences on the campus and in the community, with particular programs repeated several and sometimes dozens of times. Although no systematic audience count has been made, the University receives telephone calls in response to particular programs that have already been shown many times. The philosophy of using PL-3 is summarized by John Shepherd, Director of the University Division of Broadcast Services and Televised Instruction:

> We utilize the system to give our town what the commercial broadcaster doesn't want and what the educational station cannot use. We hope these <u>are</u> "bad" programs, in the sense of the term as used here. We <u>want</u> them to be programs which would otherwise not be available to the community. That they are topical, that they feature local people; that they may only vaguely resemble what is seen on open circuit broadcasting is our measure of quality. Transmitting programs under the conditions of closed-circuit distribution means that programs can dare to be different. They don't have to deal with safe subjects; they don't have to be 29:30 in length; they can be repeated frequently throughout the broadcast schedule to meet the needs of any segment of viewers. In short, what this means is that programs are produced to satisfy the real needs of the <u>users</u>, and when you do this, you have succeeded in the impossible -- you have automatically turned "bad" programs into "good" programs. I think you'll agree that when you have something which will do this, you have something very worthwhile indeed.[1]

PL-3 is also used for special purposes cutting across the viewing day. For example, television coverage is an integral part of the operation of the University's registration system. Enrollment information for all students and faculty are provided throughout the registration period.

As another example, the Division of Broadcast Services and Televised Instruction is the recipient of a "Notable Achievement" award

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years. Recently, it has started selling advertising in response to a recent rule of the Federal Communications Commission that cable companies are permitted to sell advertising during "natural" breaks in programming.

[1]Speech, Eugene, Oregon, January 12, 1968.

from the National Cable Television Association for its work in connection with the Lane County Health Fair. In this effort, the Division transmitted continuously over PL-3 health information for the use of the community during a two-day period.

In total, during the 1970-1971 year (September-June) PL-3 was employed for a total of 1,149 hours, not including the automated message service. These included 770 hours devoted to evening and other PL-3 "supplemental" programs, 333 hours dealing with instructional television transmissions (such as specific requests for playbacks of previously recorded materials), and the 46 hours mentioned previously for the Eugene public schools.

COST OF SERVICE

The Division of Broadcast Services and Televised Instruction operates on a budget of approximately $100,000 annually, and in addition operates equipment having an original capital cost of about $150,000. The $100,000 annual operating budget includes maintenance charges plus the salaries of technicians, program directors, and others.

In addition, the budget covers much more than simply filling channel PL-3. Among other things, the Division supplies some programs to the Oregon Educational Broadcasting Network feeding non-commercial stations in Portland and Corvallis; it supplies additional programming for the Eugene public schools; and it operates an FM radio channel. Moreover, it advises on the use of 12 satellite instructional television centers placed in various university departments, as listed in Table 4. Each of these units consists of one or more black and white 1 inch videotape recorders and cameras; they are more convenient for use by individuals and academic units than would a single centralized location.[1]

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[1] In most cases, the initial cost and replacement parts for these centers are paid for out of the budgets of the departments concerned; maintenance is covered by the $100,000 annual budget of the Division of Broadcast Services and Televised Instruction.

Table 4

SATELLITE INSTRUCTIONAL TELEVISION UNITS,
UNIVERSITY OF OREGON

Department of Psychology	Center for Advanced Study, Educational Administration
Psychology Clinic	Psychology Laboratory
Women's Physical Education Department	VISTA
College of Education	DeBusk Center
Student Counseling Center	Department of Health Education
Department of Special Education	Athletic Department

One of the most serious handicaps faced by the Division is that most of the equipment feeding PL-3 was acquired in the late 1950s and is by now obsolete and hard to maintain. (In fact, one of the cameras in service is of the same model as a camera recently placed on display in the Smithsonian Institution in Washington.)

THE POTENTIAL ROLE OF GOVERNMENT FUNDING

The problem of antiquated equipment and high maintenance raises a serious policy question. If the equipment were used for transmitting over a conventional non-commercial broadcasting station, it might be replaceable with funding from the U.S. Department of Housing, Education and Welfare under existing law covering broadcasting facilities in the Public Broadcasting Act of 1967. Existing non-commercial stations depend heavily on government support for investment in physical racilities. However, since the system in question operates exclusively through cable, it does not qualify for such financial assistance. A question arises as to whether HEW's responsibilities should not be broadened to include financial assistance to non-commercial groups originating on cable.[1] Here we have a situation similar to

[1]At this writing, legislation is being prepared to broaden the authority of HEW to permit funding of both facilities and programming for non-commerical program origination on cable.

that noted above with respect to the Corporation for Public Broadcasting. To this point in time, public television has been predominantly identified with conventional broadcast. It is only recently that growth of cable has attracted widespread public attention. As it continues to grow, serious consideration must be given to the extent to which the government should support non-commercial program origination facilities on cable, as it is now doing in broadcasting.

COOPERATION WITH OTHER INSTITUTIONS

At this writing, negotiations are taking place to enhance the effectiveness of PL-3 by transferring it to a community agency or council. Under current plans, the University of Oregon, Lane Community College (also located in Eugene), and the Eugene public school system would each be "shareholders" in the channel, with each having access on a shared-time basis. The community agency would also seek to improve public, community access to the channel by arranging with the three shareholding institutions for use of their equipment and other facilities for program origination by local community groups. This proposed cooperative arrangement will be interesting to follow, both in terms of how each of the three institutions makes use of the channel, and in terms of the success of the arrangement in facilitating access by outside community groups.

THE QUESTION OF COURSE PRESENTATIONS ON TELEVISION

A salient question arises as to why PL-3 is not employed during the school day for course presentations as it is at Oregon State University. As noted on p. 19, while Oregon State University uses its channel as a partial substitute for live instruction, the University of Oregon concentrates on supplemental materials for course enrichment as requested by individual faculty members. A major factor underlying the difference in use is that the faculty at the University of Oregon has generally resisted the idea of employing television as the substitute for live instruction. In contrast, at Oregon State University

the problem of faculty acceptance seems less serious. That Channel 5 is fairly well filled during the day, that a number of key courses are taught on television, and that enrollments have been growing over the years suggest that the effort has the backing of, or at least is not actively fought by, faculty and administrators.

How can one explain this difference in attitude between the two campuses? The scope of this report does not permit a definitive answer. However, two hypotheses are offered here, both arising from the fact that Oregon State University concentrates heavily on sciences and engineering, the University of Oregon on the liberal arts:

1. Technical subjects may be more amenable to presentation on television than liberal arts subjects. For example, laboratory demonstrations with close-up camera shots and editing may be superior to live demonstrations for many classroom purposes. (While laboratory work involving student participation cannot be handled by television, a combination of televised demonstrations and student work in the laboratory might be quite effective.) Animated graphics and other visual aids on television may likewise be more effective in science and engineering courses than in liberal arts.

2. Faculty members trained in the hard sciences may be more accustomed than their liberal arts counterparts to regarding technology as an important tool to further the interests of society. Thus, the use of television in the educational field may seem to them a logical extension. Faculty members in liberal arts, tending to emphasize the human rather than the technical or mechanical dimension, may look less indulgently on technology. For them, the use of television may be viewed as a depersonalizing force, and hence an undesirable one, in the educational field.

In addition to whatever validity these two hypotheses carry, the University of Oregon's Faculty Policy on Broadcasting, shown in Table 5, would serve further to discourage faculty participation in Television. As the table indicates, faculty members willing to teach televised courses are to be given no special recognition for their efforts.

Table 5

FACULTY POLICY ON BROADCASTING, UNIVERSITY OF OREGON

The faculty of the University of Oregon believes that, under appropriate supervision by the faculty and administration, the use of broadcasting at the university level can be a valuable and useful supplement to the educational process.

However, certain basic principles should govern the use and development of broadcast instruction and the role of the faculty member in relation to radio and television. Among them are:

A. The faculty is properly concerned with all courses for university credit taught by means of broadcasting.

B. The decision to teach a course which is broadcast should be voluntary on the part of the faculty member.

C. Decisions as to employment, tenure, promotion, and salary for those who teach courses which are broadcast should be made in the same way and under the same conditions as for any other faculty member.

D. Those instructors who are responsible for courses which are broadcast should share with the University control over their use in the form of tape or film.

E. If income is earned as a result of re-use of broadcasts by a faculty member, all such income will accrue to the faculty member after payment of costs.

F. When a faculty member teaches a course which is broadcast, his non-broadcast instructional load should be adjusted so that his total teaching time does not exceed the departmental norm.

G. The decision to offer a course for credit on radio or television must have approval of the instructional departments.

In order to implement these principles, the faculty hereby establishes the Committee on Broadcasting. The Committee, consisting of 6 members and a chairman, is to be appointed by the President on the recommendation of the Committee on Committees. The Director of the Division of Broadcast Services shall serve as ex officio. Its principal function will be the determination and interpretation of broadcast policy for the faculty. The Committee on Broadcasting should periodically consider all existing and potential televised courses and make recommendations to the departments. The Committee will also advise the Director of Broadcast Services with respect to the presentation and interpretation of the University to the Public.

Item C of the Table discloses that "decisions as to employment, tenure, promotion, and salary... should be made in the same way and under the same conditions as for any other faculty member." Moreover, under item F "his non-broadcast instructional load should be adjusted so that his total teaching time does not exceed the departmental norm." In other words, the extra preparation required for good televised presentations is not to be taken into account.

An additional complicating factor, perhaps having unfavorable effects to this day, is the University's disappointing experience with the Inter-Institutional Project of Televised Instruction -- a subject discussed briefly below.

THE INTER-INSTITUTIONAL PROJECT OF TELEVISED INSTRUCTION

This seven-year television project, starting in 1957, involved the faculties and students primarily of four Oregon institutions of higher education: Oregon College of Education at Monmouth; Oregon State University at Corvallis; Portland State College in Portland; and the University of Oregon at Eugene. It was financed by the Fund for the Advancement of Education, the Ford Foundation, and the Oregon State System of Higher Education. The general objective was to develop a series of televised courses which could be shared by the cooperating institutions in some effective manner while substantially reducing the cost of instruction. The project was devoted to such questions as:

(a) Can inter-institutional television be used to bring outstanding professors to students who otherwise would not have had contact with these professors?

(b) Can inter-institutional television be used so that the outstanding curricular strengths and specialities of each institution can be made available to students at other institutions?

(c) Does the use of inter-institutional television effect more economic and efficient utilization of teaching personnel?[1]

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[1]Glen Starlin and John E. Lallas, Inter-Institutional Teaching by Television, Final Report 1957-1964, Eugene, Oregon, August 1964, p. 4.

Although a substantial amount of useful experience was accumulated, the project was basically a failure for promoting the widespread use of televised programming. The numerous problems faced by the project are discussed in Starlin and Lallas' report. One of the most serious was getting the various institutions to cooperate in using each other's programming. For example:

> There was a marked tendency for departments to prefer to originate a course, i.e., have a member of their staff teach the televised course, than to receive it by inter-institutional television from another institution. A sort of precarious balance had to be developed among institutions, subject areas, and within departments... There seemed to be intangible factors of prestige and status compounded with the problems of origination and reception...The receiving departments, in some instances, seemed to feel that receiving television course instruction from other institutions would mitigate [sic] against their status as a department and lessen their prestige.
>
> During the several years of the project, inter-institutional television teaching did not result in extensive participation among the departments and colleges of the respective institutions nor in the development of a continuing offering of inter-institutional television courses."[1]

This experience has important implications for public policy. Much has been said about using communications satellites, cable television, and other technologies to dissiminate more widely instructional materials for the benefit of society. But who is to be given authority and the responsibility to give these courses and to provide creditation? If a satellite system were to beam a course in economics from, say, the Massachusetts Institute of Technology to the area of Santa Barbara, would the University of California at Santa Barbara handle credit for the course, or should some smaller, community college be involved? If a cable system or systems are developed in the Los Angeles basin, would they tie into the University of California at Los Angeles, into the University of Southern California, into the community colleges, or into some combination? Or are wholly new educational institutions

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[1] Ibid., p. 25.

necessary if the potential of cable is to be fully put to use? The promise of using cable television for instruction may be great, but such questions will have to be faced squarely and answered satisfactorily if the disappointment with the Oregon Inter-Institutional Project of Televised Instruction is not to be repeated. The experience of Oregon State University in sharing programming with Linn-Benton Community College, and the plans for the Tripartite sharing of PL-3 in Eugene, may provide useful insights into these questions.

IV. CONCLUDING REMARKS

The experience in both Corvallis and Eugene discloses that cable provides instructional television in greater abundance and with greater flexibility than can be accomplished through conventional over-the-air broadcasting. But the extent to which the potential is exploited elsewhere will depend heavily on the institutional environment, shaped in turn by the attitudes of faculty and administrators.

Four factors seem especially important to the future use of television in education. First is the ability and willingness of separate institutions to share programming (in much the way that textbooks are shared on a nationwide basis). We have seen that the cost savings from the use of television depend heavily on the size of the student body covered by a given expenditure on programming. Moreover, to improve the quality of instruction it is important that institutions and faculty members able to produce superior materials be in a position to make them widely available to other institutions. Unfortunately, troublesome barriers arise to the sharing of programming, as illustrated by the Inter-Institutional Project of Television Instruction, discussed above. One would hope that as the growth of cable television continues and institutions become more experienced in its use, these barriers will be overcome. In this respect the planned joint use of programming by Oregon State University and Linn-Benton Community College should be interesting to follow.

Second is the question of whether differences observed and imputed between liberal arts institutions and engineering and hard-science institutions in the use of television in Oregon are a general phenomenon. Is it in fact the case that engineering and science courses typically lend themselves more easily to the use of television than liberal arts courses? To what extent do the attitudes of faculty members and administrators, in fact, vary among these types of institutions? These questions deserve serious investigation if the potential of cable in higher education is to be carefully appraised.

Third is the role to be played by outside help. As we have seen, the use of cable channels would be more effective if they could be more satisfactorily integrated with the operations of the Corporation for Public Broadcasting and the Public Broadcasting Service. Here, serious attention must be given to the extent to which cable programming is to substitute for or complement broadcast non-commercial service. Also it may make sense for the government to support capital investments in program origination on cable in the same way that it is doing for non-commercial broadcasting. This will also require careful thought about how cable is to complement or substitute for conventional broadcast, since these two kinds of facilities will be competing for limited government funding.

As a final observation, we should note that if the experience in Oregon is any guide, we may expect substantial differences among educational institutions with respect to how they make use of cable channels. These differences suggest that serious questions will arise of channel allocations among alternative educational users, if cable grows extensively in major metropolitan areas. Elementary and secondary schools have particular kinds of needs that may be satisfied through the use of cable channels. Institutions of higher education have yet other needs, and among themselves may exhibit great differences in their employment of the channels. Some institutions may make good use of channels while others make poor use; some needs may be more important than others. How does one decide the relative importance of the array of needs, and judge what constitutes good and less-good use of channel time? The problem is not serious so long as ample channel time is available to go around (as may be the case in Corvallis and Eugene). But as cable moves into major metropolitan areas, encompassing perhaps tens of thousands of residential subscribers and a range of special government, business, and educational users, the issue of channel allocations will assume increasing importance.

As a case in point, there has been much talk of reserving channels in new cable systems for educational and other public uses. For example, the Representative Assembly of the National Education Association has

concluded that the NEA should seek to reserve at least 20 percent of all cable channels for educational purposes.[1] However, the difficulty lies not simply in deciding what percentage of channel should be devoted to such uses, but in how channels are to be allocated among alternative uses within such broad categories.

It has sometimes been suggested that certain institutions (however selected) should be given a channel free of charge. However, once a particular institution is given a channel, transfer of the channel or some portion of it to other institutions may prove difficult. The grantee may be reluctant to give up whatever has been given, particularly if there is any possibility in the future that its need for the channel will increase. Maintaining flexibility to permit rapid reallocations among various users to meet changes in needs will become of central importance.[2]

This situation is similar to the problem faced by the Federal Communications Commission in its allocations of radio spectrum space without charge among a variety of competing users, including television stations, mobile radio, military uses, and the like. Once the allocations are made, vested interests arise to make very difficult a reallocation of spectrum from one use to another in response to changes in relative needs over time.

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[1] Schools and Cable Television, Division of Educational Technology, National Education Association, Washington, D.C., 1971, p. 1.

[2] One possibility is to place cable on a common-carrier basis, where all users are given nondiscriminatory access to the system but with each paying fees in accordance with publicly filed tariffs of the cable operator. A discussion of this approach, and alternatives, is planned for future Rand reports.

Appendix A

PRODUCTION FACILITIES AVAILABLE AT THE KIDDER HALL TV CENTER FOR USE BY THE OREGON STATE UNIVERSITY STAFF

Two professional monochrome image-orthicon television (TV) cameras capable of excellent picture quality are available, plus additional vidicon cameras as needed.

Two professional Ampex 1000 model quad videotape recorders with Electronic Editor capabilities are available. A lesson for TV can be recorded in segments, or portions can be erased and re-done without dilution of picture quality. Prior to obtaining this editorial capability, the teacher had to re-do the entire lesson whenever a factual or technical error was made.

A special-effects generator provides added flexibility in production with split-screen possibilities.

The film chain is of professional quality and includes two 16mm projectors and a 35mm slide chain. Slides and film segments can be intermixed into the production of a TV lesson as desired.

A special desk with an overhead TV camera permits the teacher to sit comfortably at the desk and write or draw. In addition, pictures and transparencies can be shown at the desk if desired, eliminating the need for a chalkboard (although one is available).

Two types of microphones are available, in addition to the small lavalier microphones usually used for lesson presentations.

The studio uses quartzite lamps and has various types of background materials and easels for teacher use.

A professional staff augmented by student assistants works with the teacher in planning the TV lesson as the teacher wishes to have it produced. The teacher must be satisfied with the final results, regardless of the time it takes to produce the lesson.

The producer-director, who is also a graphics artist, works closely with the teacher in planning each production. The IRAM Center

across the hall from the TV studio does art work and makes slides for the TV lessons.

There is no charge for the production of TV lessons used as part of a regularly scheduled course. The teacher and the department determine how the lessons will be used and when they will be updated or discontinued.

The Classroom Television Committee does not encourage total teaching of any course by television. Instead, the Committee encourages the use of videotaped TV lessons of a logically visual nature that might provide additional staff time for assisting in "personalizing" the other aspects of a specific course. In some instances, departments use videotaped lessons to enable the department to preserve small recitation sections for a large enrollment course. Only by careful preparation and videotaping can a teacher combine all the effective media forms in one lesson for more effective teaching.

Appendix B

OTHER REGULAR CLOSED-CIRCUIT TV SERVICES AT OREGON STATE UNIVERSITY

1. Staff members may schedule the studio for the videotaping of a lecture with immediate play-back for self-evaluation in complete privacy. A remote-controlled camera is used for this purpose. The tape is then erased in the presence of the staff member. Since 1964, more than 500 staff members have used this voluntary service.

2. In a specially equipped classroom, graduate assistants who have recitation sections are videotaped under normal teaching conditions with later play-back for study and evaluation by their supervisors. Initiated by the Department of Chemistry, this service is in heavy demand.

3. Nearly all the Methods classes in the School of Education use the TV Center for micro-teaching purposes by teacher-trainees, drawing on a variety of formats ranging from the teaching of short lesson segments to full class-hour presentations.

4. The School of Education Counseling Center in Education Hall has three TV-equipped rooms linked to the Kidder Hall TV studio by private line. At any time, a counseling session may be recorded on one of the studio machines in complete privacy and transmitted back to the counselor for evaluation and later erasure.

5. Guest speakers brought to the university for various purposes are videotaped from a choice of ten building locations on campus; these tapes are later used (with the permission of the speaker) to enrich college course materials.

6. Selected demonstration lectures usually involving complicated equipment are videotaped in the Kidder Hall TV Center and later incorporated into appropriate courses with play-back at the specific hours desired by the instructor. These tapes are regarded as of key importance in the success of several courses.

7. Departments may prepare course review materials prior to final examinations for selected subjects, with these materials sent directly

to the residence hall viewing rooms and when desired simultaneously to over 4,000 homes and apartments served by the Corvallis Cable Company.

8. Staff members planning to be off-campus for two or more class periods may arrange for the videotaping of lectures for replay to their classes during their absence. If the lectures are audio rather than visual in content, the Instructional Resources and Materials Center (IRAM) will audio-tape the lectures and provide play-back during the class hours indicated.

9. Staff members desiring to view a specific ETV or commercial television program that is broadcast at an inconvenient hour may arrange to have this program videotaped and then replayed during the specific class hour desired.

10. Staff members may arrange to interchange specific lectures via videotape with cooperating staff members at other institutions having compatible recording equipment in Oregon or in other parts of the United States.

11. Departments desiring to videotape short courses may do so and arrange for distribution of these courses through the TV Center. Three short courses in Computer Programming have been shown to thousands of students throughout Oregon.

12. When it is available, campus staff use the TV studio for various filming purposes; the studio film chain is also used for limited distribution of 16mm film to specific classroom locations.

13. Channel 5 of the Corvallis Cable Company is also used to transmit special public lectures from the campus, sharing these lectures with the Corvallis community.

14. To give greater coverage for OSU basketball games that are sold out in advance, University Channel 5 is used to transmit these games over the Corvallis Cable Company facilities to the campus residence halls and to all Corvallis residents connected to the cable system.

15. Cooperative experimentation is conducted in integrating televised course materials with audio-tapes and slides into review

programs available to students in the Forestry and Education Self-Learning Centers.

16. The TV Center also draws on its technical staff for the testing of new equipment and special technological research devices in cooperation with the Computer Center, the Instructional Resources and Materials Center, and the Self-Learning Centers.

17. As time permits, the Center is used to enrich the programs of campus institutes and workshops and to cooperate in research projects involving the use of videotape recording.

18. The Center also offers a tape-dubbing service to the units of the State System of Higher Education, limited to the types of recorders available for this function.

19. The newest campus service involves the activation of one FM band in the TV cable connected to the Language Laboratory to send language review materials via audio-tape to listening stations in the residence halls. In addition, these tapes are shared with any resident of Corvallis who has an FM connection to the Corvallis Cable Company. Eventually, twelve of these FM bands will be activated for the transmission of audio educational materials to the residence halls.

Appendix C

AN EXAMPLE OF CABLE USE FOR INSTRUCTION IN COMPUTER PROGRAMMING AT OREGON STATE UNIVERSITY, WINTER 1971

Videotapes entitled "Introduction to OS-3" and "Introduction to FORTRAN," were shown February 1-4 and February 8-11 at 7 p.m. in Kidder Hall and at 4 p.m. on Channel 5 on the Corvallis cable. The tapes have been scheduled at night to accommodate more students and faculty.

The schedule is:

Shown in Kidder Hall --

Introduction to OS-3	Monday, Feb. 1, 7-8 p.m. Tuesday, Feb. 2, 7-8 p.m. Wednesday, Feb. 3, 7-8 p.m. Thursday, Feb. 4, 7-9 p.m.
Introduction to FORTRAN	Monday, Feb. 8, 7-8 p.m. Tuesday, Feb. 9, 7-8 p.m. Wednesday, Feb. 10, 7-8 p.m. Thursday, Feb. 11, 7-9 p.m.

Shown on Corvallis Cable TV Channel 5 --

Introduction to OS-3	Monday, Feb. 1, 4-5 p.m. Tuesday, Feb. 2, 4-5 p.m. Wednesday, Feb. 3, 4-5 p.m. Thursday, Feb. 4, 4-6 p.m.
Introduction to FORTRAN	Monday, Feb. 8, 4-5 p.m. Tuesday, Feb. 9, 4-5 p.m. Wednesday, Feb. 10, 4-5 p.m. Thursday, Feb. 11, 4-6 p.m.

The tape series can also be selectively scheduled by instructors. Professors may contact Kidder Hall TV Center to arrange the showing of any of these tapes in their classes.

Appendix D

CORVALLIS CABLE CHANNEL 11 PROGRAM GUIDE

Tuesday, Feb. 2, 1971

7:00 Consumer Report

7:15 Courtside Comments

7:30 Special -- KBVR-FM Radio

8:00 We've Got Something To Say
(Black Student Union)

8:45 Film Special

Thursday, Feb. 4

7:00 Consumer Report

7:15 Courtside Comments

7:30 Film Special (Asia: Changes and
Challenge)

8:00 Dave Hall ASOSU President
(Call 754-2003 with questions)

9:00 Community Campus Report

Friday, Feb. 5, Sports

7:15 Live Wrestling, OSU vs. University
of Oregon

Saturday, Feb. 6, Sports

7:45 Live Basketball, OSU vs. University
of Oregon

In addition to Channel 5, the University instructional cable channel, broadcast trainees in the Department of Speech Communication gain experience in presenting programs over cable Channel 11, the Corvallis Cable Company's community originating channel.

Appendix E

THE USE OF CABLE CHANNEL PL-3, DIVISION OF BROADCAST SERVICES, UNIVERSITY OF OREGON
(Fall 1965)

PL-3 is the University of Oregon's closed-circuit television. From studios in Villard Hall, PL-3 reaches sets in each dormitory and was available beginning September 1965 to all other living groups and areas through new connections. Programming occurs during late afternoon and early evening hours. Starting the first full year of operation with an expanded staff and facilities, PL-3 emphasized the opportunity for supplementary classroom presentations. This was in addition to programs of general interest and cultural enrichment.

PL-3 has several advantages that should be considered in curricular planning: (1) Materials used on PL-3 do not take up valuable class time -- all presentations can be made outside of class time. Thus, no classroom time is used except for the announcement of the time of the broadcast and possible discussion centered around the presentation. (2) The unstructured programming allows each presentation to be of any desired length -- five minutes or ninety minutes. (3) Showing material over PL-3 means that one need not be concerned with the physical limit .tions of the classroom. A number of classrooms on the campus receive the television signal.

PL-3 can be adapted to specific class needs in many ways:

(1) Films: With the wealth of films available from various sources, PL-3 can show educational or entertainment films applicable to many classes.

(2) Videotapes: Relevant programs broadcast by other channels can be videotaped and re-run at times more convenient to the instructor and the class.

(3) Presentation of Experiments: Complex and expensive experiments can be videotaped or filmed once and then

replayed any number of times to one class or several classes. There would be no need to repeat the same demonstration in several classes.

(4) Professorial Dialog: Panels of professors (intra- or interdepartmental) could discuss a problem related to a specific course. Such a program could be taped and run several times. Such a procedure could, for example, allow the presentation of differing points of view, which in turn could be used to enrich the course materials.

(5) Interviewing Guest Speakers: Most visiting speakers address themselves to a general audience; PL-3 offers a chance for interviews in depth, probing beyond the level possible in a public presentation. The tape can be stored for later use.

(6) Filming Special Subjects: To a limited extent, it will be possible to film material and events that cannot be brought into the Villard Hall studios.

(7) Re-runs: Films shown in class can be re-run on PL-3 for the benefit of students absent when the first presentation was made. The chance for a second or third viewing for many students increases the educational value of the film.

(8) Performances: Special musical and dramatic presentations can be made. These may be followed by discussion by the director or performer of the special methods employed.

The primary value of PL-3 lies in the enrichment of the student's academic experience. The secondary values are numerous. Some of the most obvious are: (1) aiding the college instructors in presenting a wider range of stimulating experiences, (2) presenting academic experiences in the setting of the living units, and (3) giving students the opportunity to share a common educational experience through group viewing and consequent discussion.

Appendix F

EVENING PL-3 PROGRAM SCHEDULE, UNIVERSITY OF OREGON,
APRIL 5-9, 1971

Monday, April 5

6:30 Movies & Theater: Discussion of trends toward sexual permissiveness in films and stage presentations.

7:30 3 Score or More: A new series for Senior Citizens; Tonight: Education for Senior Citizens.

8:00 Fly-tying Workbench

8:30 A Trip to Nowhere: Drug use in America.

9:30 Spanish Turmoil: The Spanish Civil War and the Franco Regime that followed it.

Tuesday, April 6

6:30 Film Generation and the Graphic Arts: Film-makers use of sophisticated graphics techniques.

7:30 Train to Calcutta: A journey through Indian life and culture via a 1,000 mile train trip from Bombay to Calcutta.

8:30 House in the Jungle: Current social and political problems of Indonesia.

9:30 Mass Media and Children: Highlights of testimony before the Child Development and the Mass Media forum of the White House Conference on Children.

Wednesday, April 7

6:30 Fly-tying Workbench (Repeat from April 5).

7:00 They Went That-a-way: The history of the western film.

7:30 3 Score or More (Repeat from April 5).

8:00 Horowitz at Carnegie Hall: Pianist Vladimir Horowitz in a special concert for television.

9:00 Film Generation and the Graphic Arts (Repeat from April 6)

10:00 In Search of Hamlet: Different interpretations of the character of Hamlet.

Thursday, April 8

6:30 A Trip to Nowhere (Repeat from April 5).

7:30 House in the Jungle (Repeat from April 6).

8:30 Shostakovich: The life and work of the Russian Composer, Dimitri Shostakovich.

9:30 Portrait of Helen Hayes: A commemoration of Helen Hayes' 65-year career on the American stage.

Friday, April 9

6:30 In Search of Hamlet (Repeat from April 7).

7:30 Minorities and the War: Minority students at the University of Oregon discuss the Vietnam War, live from P1-3 studios.

8:30 Portrait of Helen Hayes (Repeat from April 8).

10:00 Fly-tying Workbench (Repeat from April 5).

10:30 LCC News: News from Lane Community College.